DEPARTMENT OF TRANSPORTATION
DIVISION OF ENGINEERING SERVICES
Office of Structural Materials
Quality Assurance and Source Inspection

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Contract #: 04-0120F4
Cty: SF/ALA Rte: 80 PM: 13.2/13.9
File #: 69.28

WELDING INSPECTION REPORT

Resident Engineer: Pursell, Gary
Address: 333 Burma Road
City: Oakland, CA 94607

Report No: WIR-002588
Date Inspected: 25-Apr-2008

Project Name: SAS Superstructure
Prime Contractor: American Bridge/Fluor Enterprises, a JV
Contractor: Zhenhua Port Machinery Company, Ltd (ZPMC), Changxing Island

OSM Arrival Time: 630
OSM Departure Time: 1730
Location: Shanghai, China

CWI Name:	See below	**CWI Present:**	☑ Yes ☐ No
Inspected CWI report:	☐ Yes ☑ No ☐ N/A	**Rod Oven in Use:**	☑ Yes ☐ No ☐ N/A
Electrode to specification:	☑ Yes ☐ No ☐ N/A	**Weld Procedures Followed:**	☑ Yes ☐ No ☐ N/A
Qualified Welders:	☑ Yes ☐ No ☐ N/A	**Verified Joint Fit-up:**	☐ Yes ☑ No ☐ N/A
Approved Drawings:	☑ Yes ☐ No ☐ N/A	**Approved WPS:**	☑ Yes ☐ No ☐ N/A
		Delayed / Cancelled:	☐ Yes ☑ No ☐ N/A

Bridge No: 34-0006
Component: OBG/Tower

Summary of Items Observed:

Caltrans Quality Assurance (QA) Inspector Sherri Brannon arrived on site at the Zhenhua Port Machinery Company (ZPMC) facility at Changxing Island, in Shanghai, China to periodically monitor welding and Quality Control (QC) functions. While on site the QA Inspector observed and/or discovered the following.

OBG/Tower Sub-Assembly
Bay 2
77 & 144 Meter Mock-up:
QA Inspector Brannon observed tower mock-up to be idle during this shift. QA Inspector Brannon also, randomly observed ZPMC personnel CNC torch cutting with 75% natural gas and 25% oxygen for interior splice plate for various tower elevations.

Bay 3-OBG side panels (Gantry 2):
QA Inspector Brannon randomly observed ZPMC qualified welders Mr. Liz Hao Qian ID#048810, Mr. Xin Meng ID#053742 and Mr. Sun Ti Yu ID#054459 fillet welding joining T-stiffeners to side panel plate for SP473-001 weld joints 001~028 and SP475-001 weld joints 001~014. Mr. Liz, Mr. Xin and Mr. Sun was observed welding in the 2F (horizontal) position utilizing flux cored arc welding (FCAW) process with a 1.4mm diameter electrode, filler metal brand Supercored 71H, class E71T-1. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2132-3.

Bay 3-OBG side/bottom/edge panels:
QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various T stiffeners plate

utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508 non-FCM and filler metal brand E7018, class THJ506Fe-1 for FCM material . Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112 and WPS-B-P-2112-FCM respectively.

Bay 3 – W shapes side panel Sub Assembly:
ZPMC NDT (UT):
QA Inspector Brannon randomly observed ZPMC Ultrasonic Testing Technician Mr. Li Li Ming performing lamination Scan with 2.5mhz transducer and performing shear wave using a 70° transducer on the following tower diaphragm splice weld: SP334-001-002 & 003 (accept), SP334-001-020 & 022 (accept), SP361-001-002 & 003 (accept), SP361-020-002 & 022 (accept), SP121-001-002 & 003 (accept), SP121-001-020 & 022 (accept), SP148-001-002 & 003 (accept) and SP148-001-020 & 022 (accept). QA Inspector Brannon observed accept and rejected marked on the floor beam flange plates.

Bay 4 – Heat straightening side panel:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various side/bottom/edge panels and tower diaphragm plates. Side/bottom/edge panels cause for heat straightening welding distortion and tower diaphragm pates cause for heat straightening mill induced. Heat Straightening is performed by flame straightening using oxygen acetylene or natural gas using a hand torch.

Bay 4 Tower 33 Meter Elevation:
QA Inspector Brannon randomly observed ZPMC welder Mrs. Gu Cai Hong ID #053748 welding fill/cover pass's joining SA276 (S) to P284 (S) weld joint # SSD1 SA276 -1A & 2A. Mrs. Gu was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.0mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Zhao Chen Sun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Zhao Chen Sun to be: preheat temperature of 180°C and welding parameters amps of 625, volts of 30.3, and a travel speed of 486. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 4 Tower 23 Meter Elevation:
QA Inspector Brannon randomly observed ZPMC welder Mr. Jiang Jing Teng ID #046830 welding fill/cover pass's joining SA238 (E) to P414 (E) weld joint # ESD1 SA238 -3A & 4A. Mr. Jiang was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.0mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Mr. Zhao Chen Sun verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Zhao Chen Sun to be: preheat temperature of 180°C and welding parameters amps of 620, volts of 30.1, and a travel speed of 484. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1.

Bay 4-OBG edge/side panels:
ZPMC NDT (MT):

QA Inspector Brannon observed ZPMC magnetic particle (MT) technician Mr. Bo Ting Rui, Mr. Zhou Dong Yun and Mr. Cai Xin Xin performing (MT) at EP011-001 welds joints 001~004 (accept), EP012-001 welds joints 001~004 (accept), EP009-001 welds joints 001~004 (accept), EP008-001 welds joints 001~004 (accept), EP020-001 welds joints 005~008 (accept), EP019-001 welds joints 005~008 (accept), EP018-001 welds joints 005~008 (accept), EP006-001 welds joints 001~004 (accept), EP016-001 welds joints 001~004 (accept), EP007-001 welds joints 011~014 (accept), SP091-001 welds joints 016~029 (accept) and SP091-001 welds joints 002~003 (accept). QA Inspector Brannon observed accept and rejected marked on the side/ bottom panels.

Bay 7-OBG - Floor Beam Sub Assembly:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various floor beam plates. Cause for heat straightening welding distortion. Heat Straightening is performed by flame straightening using oxygen acetylene with hand torch.

Bay 7-OBG floor beam panels:
QA Inspector Brannon randomly observed ZPMC qualified welders, tack welding various floor beam web splice connections utilizing a shielded metal arc welding (SMAW) process with a 4.0mm diameter electrode, filler metal brand E7018, class TL508. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-P-2112.

Bay 7-OBG - Floor Beam Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mr. Sun Guzuo ID #058100 groove welding joining floor beam web splice at FB024-001-081. Mr. sun was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Hu Wei Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Hu Wei Qing to be: preheat temperature of 86°C and welding parameters amps of 496, volts of 30.1, and a travel speed of 428. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-L2c-S-1.

Bay 8 – 38 Meter Tower Diaphragm Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Xi Pei Pei ID #048431 groove welding fill pass's joining SA126 (S) to P257 (S) weld joint SSD1 SA126-1A. Mrs. Xi was observed welding in the 1G (flat) position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand EM12K, class JW3machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Li Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Lv Li Qing to be: preheat temperature of 60°C and welding parameters amps of 675, volts of 32.5, and a travel speed of 600 mm/min. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-2221-B-U3c-S-1.

Bay 8 – 13 Meter Tower Diaphragm Sub Assembly:
QA Inspector Brannon randomly observed ZPMC qualified welder Mrs. Ma Ying ID #045270 groove welding joining SA290 (E) to P308 (E) weld joint ESD1 SA290-11A/12A. Mrs. Ma was observed welding in the 1G (flat)

position utilizing a submerged arc welding (SAW) process with a 4.8mm diameter electrode, filler metal brand LA-85, class ENi5, machine. QA Inspector Brannon observed the ZPMC QC CWI Inspector Lv Li Qing verifying that the welding parameters and pre-heat were in accordance with the Welding Procedure Specification (WPS). QA Inspector observed preheat and welding parameters measured by the QC CWI Inspector Lv Li Qing to be: preheat temperature of 180°C and welding parameters amps of 612, volts of 30.2, and a travel speed of 472. Welding parameters observed by QA Inspector Brannon appear to be in general compliance with the approved WPS-B-T-3221-B-U3c-S-1

Bay 8 – Heat straightening:
QA Inspector Brannon randomly observed ZPMC personnel performing heat straightening on various tower diaphragm flange plates. Tower diaphragm plates cause for heat straightening mill induced distortion. Heat Straightening is performed by flame straightening using natural gas with a hand torch.

Bay 8 – Heat straightening:
ABF has allowed ZPMC to perform Heat Straightening (HS) with active force on 04-25-2008. The use of counter weights is not a step in the ABF/ZPMC approved fabrication plan for the Tower Diaphragm plates. The observed diaphragm plate with this heat straightening method is for the 18 Meter elevation bottom SA301(W). The referencing heat straightening procedure was recorded as ZPMC (HS) Report Number HSR1(T)-516, ZPMC. Also, see incident report written on 04-25-08.

Bay 8 – 47.6/28 Meter Tower Diaphragm Sub Assembly:
ZPMC NDT (UT):
QA Inspector Brannon randomly observed ZPMC Ultrasonic Testing Technician's Mr. Xue Haiyong and Mr. Ma Ji Long performing lamination Scan with 2.5mhz transducer and performing shear wave using a 45° & 70° transducer on the following tower diaphragm splice weld: NSD1 SA326-1A/1B (accept) and WSD1 SA316-6A/6B (accept). QA Inspector Brannon observed accept and rejected marked on the tower diaphragm splice plates.

The following digital photograph below illustrates observation of the activities being performed.

Summary of Conversations:
No relevant conversations to report.

WELDING INSPECTION REPORT

(Continued Page 5 of 5)

Comments

This report is for the purpose of determining conformance with the contract documents and is not for the purpose of making repair or fit for purpose recommendations. Should you require recommendations concerning repairs or remedial efforts please contact Mazen Wahbeh, (818) 292-0659, who represents the Office of Structural Materials for your project.

Inspected By:	Brannon,Sherri	Quality Assurance Inspector
Reviewed By:	Cuellar,Robert	QA Reviewer